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AB 2339 Notes

These notes primarily deal with Issue #2. While all of the concerns mentioned apply equally to Res. & Non-Res installations, my examples will be residential, which is what I have the most experience with.

Current CEC Policy

HVAC equipment is modeled based on name plate efficiencies (as listed in the CEC Certified Appliance Directory) only. System efficiencies are not normally modeled. The only exception is when one wants to get credit for a higher system EER. In this case some on-site HERS verification is required.

Interim Modeling Procedure

Designers have been asking the CEC for a method of directly inputting COP & EER, in the performance software, for years. I designed my first GSHP system in 1997, and have been regularly requesting this capability ever since. The CEC must allow equipment that is rated in EER & COP to have those efficiencies directly input into the performance compliance software, both Res & Non-Res.

Title-24 Part6, Section 112, lists **MANDATORY** requirements for various types of space conditioning equipment. This equipment may only be installed if it meets the efficiency requirements listed in Tables 112-A through 112-M. All of these required efficiencies are stated in terms of COP, EER and IPLV. How can the Commission require the specification of efficiencies in COP & EER, but not allow direct modeling of these mandatory COPs & EERs?

I have been successfully utilizing the method described by Dee Ann Ross to model heat pumps rated in COP & EER as "Combined Hydronic" systems, for compliance. These systems usually provide both space heating and domestic hot water, but not space cooling. The problem with modeling the EER of a system that includes cooling is that there is no approved HERS testing procedure. As an interim measure, I suggest using the same HERS procedure for GSHPs that the CEC has already approved for the Daikin Altherma Heat Pump systems.

Res & Non-Res Installation Certificates & Acceptance Procedures

The Installation Certificate & Acceptance Procedures for ***all*** hydronic systems must be improved. This will be facilitated by the PIER study requested in the next section.

Proposed CEC Policy Change

Many of the commenters have raised the issue that the equipment nameplate efficiencies and actual as-built system efficiencies are often radically different. Modeling ***system*** performance of HVAC systems would definitely be more accurate, however this would require a change in basic CEC policy. In order to justify this policy change I propose the following PIER study.

PIER Study

Installation Certificates, Acceptance Procedures & HERS Verification

I believe many of the recommendations of the PIER report could be met with improved installation, acceptance and HERS verification. Particular attention should be placed on improving the Installation Certificates. It is much more efficient to eliminate problems at the installation phase, rather than trying to correct problems not identified until commissioning.

Develop Rule Sets that model System efficiency

Depending on how rigorous we want to get, we can also propose refinements to the compliance software through ACM improvements. We should keep in mind that we are talking about developing Code Compliance software, not design verification or actual performance predicting software.

Note that the goal of AB 2339 is to ***remove*** barriers to the installation of GSHP systems. To limit our analysis and recommendations to ***only*** GSHPs, rather than all hydronic systems, would create an ***additional*** barrier with increased costs that would only apply to Geothermal systems.

Develop Incentive for use of High Efficiency Pumps

The CEC is also way behind the curve with regards to high efficiency pump technologies. The Commission should incentivize the use of these more efficient/expensive pumps by giving credit for their use in performance modeling simulations.

Respectfully submitted:

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13 May 2013